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ON SOME CHANGES IN THE NAMES, GENERIC AND SPECIFIC, OF CERTAIN FOSSIL FISHES.

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THE writer desires to call the attention of paleontologists to the following changes, which it seems to be necessary to make in the nomenclature of certain fossil fishes. Nearly all these changes pertain to North American species or to genera represented in North America. While there may appear to be a considerable number of names which have been replaced by others, there are in reality few, when compared with the large number of species whose history has been studied. While it is to be regretted that old and well-known names have to be cast aside and new or unfamiliar ones substituted, the writer believes that it is better to reform nomenclature as soon as errors are discovered than, by repeating them, to make more difficult of accomplishment what must be done at some time by somebody.

In 1875¹ St. John and Worthen described a species of *Cladodus* which they called *C. carinatus*. The same name was employed in 1889 by Dr. Newberry² for an entirely distinct species. This requires, therefore, a new name, which may be *C. coniger*.

In 1894 Professor E. W. Claypole³ described a supposed species of *Cladodus* which he designated as *C. (?) magnificus*. The name is, however, preoccupied, Tuomey having in 1858⁴ described a *C. magnificus* from the state of Alabama. The former species may be named *C. claypolei*, in honor of the describer.

In 1891⁵ Professor Cope described a fossil tooth which he called *Hybodus regularis*. However, the specific name is pre-

¹ *Geol. Surv. Ill.*, vol. vi, p. 279, Pl. IV, Figs. 6 and 7.

² *Palæoz. Fishes N. A.*, p. 103.

³ *Amer. Geol.*, vol. xiv, p. 137, Pl. V.

⁴ *Second Report Geol. Alabama*, p. 39.

⁵ *Proc. U. S. Nat. Mus.*, vol. xiv, p. 448, Pl. XXVIII, Fig. 2.

occupied, having been applied to a *Hybodus* by Reuss in 1846.¹ The first-mentioned species may be renamed *H. copei*.

In 1866² Newberry and Worthen described, from the Burlington limestone of Iowa, a tooth which they called *Helodus compressus*. This species is now regarded as belonging to the genus *Hybocladodus*. In 1870³ the same writers described another *Helodus compressus*, from the same horizon, in Illinois. In renaming the latter species I shall, by calling the fossil *H. wortheni*, endeavor to honor the director of one of the most creditably conducted of our state geological surveys.

The name *Stemmatodus* was applied in 1875⁴ by St. John and Worthen to certain bodies which they regarded as teeth of shark-like animals, but which may be, as Mr. A. S. Woodward has suggested, dermal denticles. The name had, however, been employed by Heckel in 1856 for a genus of pycnodont fishes. Clearly the name, as employed by St. John and Worthen, must yield to some other term. I propose *STEMMATIAS*. The type will be *Stemmatias cheiriformis* St. John and Worthen. The recognized species are *S. bicristatus*, *S. bifurcatus*, *S. compactus*, *S. keokuk*, and *S. symmetricus*, all described by the authors referred to.

The name *Goniodus* was employed by Agassiz⁵ in 1838 to designate a genus of sharks which had previously been called by Blainville *Echinorhinus*. Being therefore a synonym of *Echinorhinus*, it is not available as the name of any other genus. Nevertheless, it was in 1889 applied by Newberry⁶ to certain pavement-like teeth from the Huron shales of Ohio. As a substitute for Dr. Newberry's name, Mr. S. A. Miller, in 1893,⁷ proposed the name *Xenodus*. The type and only known species is *X. hertzeri* (Newberry).

In 1862⁸ Morris and Roberts applied one of Agassiz's manu-

¹ *Verstein. böhm. Kreidef.*, pt. ii, p. 98.

² *Geol. Surv. Ill.*, vol. ii, p. 78, Pl. V, Fig. 1.

³ *Geol. Surv. Ill.*, vol. iv, p. 360, Pl. III, Fig. 15.

⁴ *Geol. Surv. Ill.*, vol. vi, p. 328.

⁵ *Poissons Foss.*, vol. iii, p. 94.

⁶ *Palæoz. Fishes N. A.*, p. 67.

⁷ *N. A. Geol. Palæont.*, 1st App., p. 718.

⁸ *Quar. Journ. Geol. Soc.*, vol. xviii, p. 101.

script names, *Xystrodus*, to a species which had in 1855 been described and figured as *Cochliodus striatus* by McCoy. The name therefore must date from 1862. But in 1860 Plieninger¹ described with some minuteness some Hybodont teeth, to which he gave the name *Xystrodus finitimus*. This earlier use of *Xystrodus* makes it impossible, or at least unwise, to use it in the sense given it by Morris and Roberts. The name PLATYXYSTRODUS may be used instead. The type will be as before, *P. striatus* (McCoy). The American species are *P. bellulus*, *P. imitatus*, *P. inconditus*, *P. simplex*, and *P. verus*, all by St. John and Worthen.

In 1883² Davis founded a genus of cochliodont sharks, to which he gave the name *Tomodus*. The name had, however, been used for other teeth in the same group by Trautschold in 1879.³ It was, therefore, clearly preoccupied. Subsequently Trautschold renamed his genus *Oxytomodus*, but this in no way made *Tomodus* more available for Davis's genus. On this point see Mr. A. S. Woodward's remarks.⁴ For the genus described by Davis, S. A. Miller⁵ has proposed to substitute *Icanodus*. The type will, of course, be *I. convexus* (Davis). One American species belongs doubtfully to the genus. This is *I. (?) limitaris* (St. John and Worthen).

In 1843⁶ H. von Meyer described, from the lower Miocene of Hesse Darmstadt, a species of ray which he called *Myliobatis serratus*. Leidy,⁷ therefore, encroached on occupied territory when he named a fossil ray from the Eocene of New Jersey *M. serratus*. This may be called *M. leidyi*.

Two species of fossil Dipnoi require new names. In 1877⁸ Professor Cope described remains which he denominated *Ctenodus gurleyanus*. In 1889 S. A. Miller⁹ modified the specific

¹ *Neues Jahrb. Min.*, p. 695.

² *Trans. Roy. Dublin Soc.*, [2], vol. i, p. 446.

³ *Nouv. Mém. Soc. Imp. Nat. Moscou*, vol. xiv, p. 55.

⁴ *Cat. Foss. Fishes*, vol. i, p. 191.

⁵ *N. A. Geol. Palæont.*, 1st App., p. 716.

⁶ *Neues Jahrb. Min.*, p. 703.

⁷ *Proc. Acad. Nat. Sci. Phila.*, p. 395.

⁸ *Proc. Amer. Philos. Soc.*, vol. xvii, p. 54.

⁹ *Palæoz. Foss. N. A.*, p. 593.

name to *gurleianus*. In 1891¹ Mr. Woodward referred the species to *Sagenodus*. In a posthumous paper, published in 1897,² Cope described as a new species another *Sagenodus gurleianus*. This evidently requires a new name. I propose *S. textilis*.

In 1889³ Newberry described a dipnoan tooth, which he called *Dipterus* (*Ctenodus*) *radiatus*. But the name is preoccupied. Eichwald in 1844⁴ described a *C. radiatus*, and in 1858⁵ this was referred by Pander to the genus *Dipterus*. Newberry's species may be called *D. contraversus*.

The genera which have been known as *Rhizodus* and *Megalichthys* are particularly exasperating cases from the point of view of nomenclature, and I regret that it appears necessary to deal with them. *Megalichthys* is credited to Agassiz and Hibbert, and was apparently first proposed in a paper published by Hibbert in 1836.⁶ The only species there described is *M. hibberti*, although another, *M. falcatus*, is mentioned. The age of the enclosing rocks is Lower Carboniferous. The genus and species are clearly based on the materials collected at Burdiehouse, near Edinburgh, although the descriptions are clouded somewhat by Agassiz's knowledge of the remains of a different fish found in the museum at Leeds. This was derived from the coal measures, and Agassiz regarded it as identical with the Scottish specimens. When in 1844⁷ Agassiz came to describe *M. hibberti*, he based his description on the Leeds specimens; and since that time the name has adhered to the coal-measures species. It is evident that the name must be restored to the Scottish types. The latter were figured by Buckland in 1837,⁸ partly under the name of *M. hibberti* and partly as *Holoptychus hibberti*. Owen in 1841⁹ imposed on these Scottish specimens

¹ *Cat. Foss. Fishes*, vol. ii, p. 261.

² *Proc. Amer. Philos. Soc.*, vol. xxxvi, p. 82, Pl. I, Fig. 9.

³ *Palæoz. Fishes N. A.*, p. 119, Pl. XXVII, Fig. 33.

⁴ *Bull. Soc. Imp. Nat. Moscou*, vol. xvii, p. 827.

⁵ *Ctenodipt. Devon. Syst.*, p. 22.

⁶ *Trans. Roy. Soc. Edinb.*, vol. viii, pp. 169-282, Pls. V-XII.

⁷ *Poissons Foss.*, vol. ii, pt. ii, p. 89, Pls. LXIII, LXIV.

⁸ *Geol. and Mineral.*, ed. 2, vol. ii, p. 43, Pl. XXVII.

⁹ *Odontography*, vol. i, p. 75.

the name *Rhizodus hibberti*, and the name has clung to them ever since.

Evidently all the species which have been marshalled under the name *Rhizodus* must be placed under *Megalichthys* of Agassiz and Hibbert. The British species are *M. hibberti* Agassiz and Hibbert and *M. ornatus* Traquair. The American species are *M. angustus* (Newberry), *M. incurvus* (Newberry), *M. lancifer* (Newberry), and *M. occidentalis* (Newberry and Worthen).

What, then, must be done with the species which have been masquerading under *Megalichthys* of Agassiz (1844)? The first generic name applied to any of this group of species after 1844 was *Centrodus*, given by McCoy¹ (1848). This, however, is preoccupied, having been applied to some fossil elasmobranch teeth by Giebel in 1847.² The next name in order of time is apparently *Parabatrachus*, proposed by R. Owen in 1853.³ This was given to a portion of the skull of an animal, which Owen regarded as batrachian, near *Archegosaurus*, but which is now identified with *Megalichthys* of Agassiz (1844). The type species is *P. colci*, but this is now regarded as identical with *M. hibberti* Agassiz (1844). It may not at first thought be pleasing to our ideas of propriety to accept this name for a fish, but we must remember that one of our common marine fishes bore for a long time the generic name *Batrachus*.

What specific name is the species described by Agassiz in 1844 to bear? It cannot be *hibberti*, because the name *M. hibberti* had in 1836 been applied to another species. This will furnish some compensation for the disadvantages resulting from changes, because the name has been a source of confusion, and because Hibbert had nothing to do with it, except to speak of it incidentally. The earliest name given in the synonymy of the species by Mr. Woodward⁴ is one of Agassiz's names, *maxillaris*.⁵ If our conclusions, then, are correct, the fish which

¹ *Ann. Mag. Nat. Hist.*, [2], vol. ii, p. 3.

² *Fauna Vorwelt; Fische*, p. 344.

³ *Quar. Journ. Geol. Soc.*, vol. ix, p. 67.

⁴ *Cat. Foss. Fishes*, vol. ii, p. 378.

⁵ *Poissons Foss.*, vol. ii, pt. ii, p. 96.

in all recent works has been known as *M. hibberti* becomes *Parabatrachus maxillaris* Agassiz. Other British species are *P. coccolepis* (Young), *P. intermedius* (Woodward), *P. laticeps* (Traquair), *P. pygmaeus* (Traquair), and *P. laevis* (Traquair). The American species are *P. nitidus* (Cope), *P. ciceronius* (Cope), and *P. macropomus* (Cope). *P. maxillaris* possibly also occurs in this country. *P. nitens* (A. Fritsch) occurs in Bohemia.

Certain well-known genera and one species of pycnodont fishes bear names that are not tenable.

In 1872¹ Dr. Leidy described a pycnodont, which he named *Pycnodus faba*. But already in 1847² H. von Meyer had given the same name to remains from the Eocene of Germany. Leidy's species may then be given the name *P. phaseolus*, in allusion to the resemblance of the larger teeth to the pods of the wild bean, Phaseolus.

As Mr. A. S. Woodward tells us,³ the generic name Microdon, which has been used so long for a genus of pycnodonts, being proposed by Agassiz in 1833,⁴ had been used previously in entomology by Meigen in 1803. It is, I am informed, now in current use as a genus of Diptera. If this name may be employed in both ichthyology and in entomology, it seems reasonable that the conchologists may be allowed to resurrect Conrad's Microdon; and we might then discuss the question whether the fish Microdon subsisted wholly on such mollusks as Microdon, or occasionally varied its diet by adding such Diptera as Microdon. I regard it as subversive of the purposes of scientific nomenclature to perpetuate the use of such preoccupied names. As I find no synonym of Agassiz's Microdon which may take its place, it becomes necessary to propose a new name. This is POLYPSEPHIS, from πολυψήφῖς, *with many pebbles*, in allusion to the numerous rounded teeth. No American species are at present referred to this genus.

Mesodon of Wagner (1851)⁵ is not available in ichthyology,

¹ *Proc. Acad. Nat. Sci. Phila.*, p. 163.

² *Neues Jahrb. Min.*, p. 186.

³ *Cat. Foss. Fishes*, vol. iii, p. 221.

⁴ *Poissons Foss.*, vol. ii, pt. i, p. 16.

⁵ *Abhandl. k. bay. Akad. Wiss., math.-phys. Cl.*, vol. vi, p. 56.

having been used by Rafinesque for a genus of mollusks in 1819. According to Mr. Woodward,¹ *Typodus* of Quenstedt (1858) is probably identical with *Mesodon* of Wagner. It is therefore accepted provisionally as the generic name of those pycnodont fishes which have hitherto been called *Mesodon*. The American species will be *T. abrasus* (Cragin), *T. dumblei* (Cope), and *T. diastematicus* (Cope).

The genus *Catopterus* Redfield cannot be retained in the sense now given it. It was proposed by J. H. Redfield in the year 1837.² In his paper he states that the name had been used by Agassiz originally for a very different fish; but since Agassiz's *Catopterus* had been reduced to synonymy, Redfield evidently thought that he was at liberty to use it again. Any one who has had experience in systematic work has soon learned how much confusion this practice produces. Few naturalists would now, I think, defend this practice, even though they may accept such preoccupied names on account of their long standing. Agassiz's *Catopterus* is a synonym of *Dipterus*. For the species which have been included under *Catopterus* of Redfield, no other generic name has, so far as I know, been proposed. I therefore offer the new name REDFIELDIUS, in honor of William C. Redfield and John Howard Redfield, father and son, two of the early students of American palæichthyology. The type of the genus will be, as before, *R. gracilis* (Redfield). The other recognized species are *R. anguilliformis*, *R. minor*, *R. ornatus*, *R. parvulus*, and *R. redfieldi*. The change of name of the genus will abolish *Catopteridæ* as the name of the family. It may be replaced by *Dictyopygidæ* from *Dictyopyge*, the other genus of the family.

The name *Eugnathus*, by which a well-known group of fossil fishes has long been known, must give way to some other term. *Eugnathus*, as a name for fishes, was first employed by Agassiz in 1844,³ the type species being *E. orthostomus*. However, the name had been used as early as 1834 by Schönherr for a genus

¹ *Cat. Foss. Fishes*, vol. iii, pp. 199, 215.

² *Ann. Lyc. Nat. Hist. N. Y.*, vol. iv, p. 39.

³ *Poissons Foss.*, vol. ii, pt. ii, p. 97.

of curculionid beetles, and is in current use. So far as I can determine, the next name in succession is J. W. Davis's *Lissolepis*¹; but this is preoccupied, having been imposed on a genus of lizards by Peters in 1872. The next name in order seems to be Zittel's *Isopholis*.² Zittel does not indicate the type of his genus; and the first species named under it, *crenulatus*, is not, according to Mr. Woodward,³ a member even of the same suborder. The position of *I. münsteri*, the species figured, is also doubtful. However, these may be removed and the genus allowed to rest on the species remaining; and as type of *Isopholis* we may take the species described by Agassiz as *Pholedophorus longiserratus*, it being also one of the species included by Zittel in his *Isopholis*. The family name *Isopholidæ* may be derived from this genus.

In 1849,⁴ and again in 1852,⁵ Roemer defined from manuscript of Debey a new genus of fishes, which he called *Ancistrodon*. The generic name cannot in my opinion stand, being practically preoccupied by *Agkistrodon*, proposed in 1799 by Palisot de Beauvois.⁶ Although differing in form, the two names are merely different ways of transliterating the same Greek words. Furthermore, many authors have written the ophidian generic name *Ancistrodon*. Professor S. F. Baird so spelled the word as far back as 1859. Unless we are prepared to adopt the recently suggested rule to regard as eligible all names which differ by a single letter, no matter how that difference has been produced, we must, I think, abandon *Ancistrodon* as a generic name in ichthyology. In its place I offer the name *GRYPODON*, from γρῦπος, *hooked*, and ὀδών, *tooth*. The type of the genus is *G. texanus* Dames. Other species described⁷ are *G. mosensis* Dames, *G. lybicus* Dames, *G. armatus* Gerv., *G. vicentinus* Dames.

I have already referred to S. A. Miller's First Appendix to

¹ *Ann. Mag. Nat. Hist.* (1884), vol. xiii, p. 448.

² *Handb. Palæont.*, vol. iii, p. 216.

³ *Cat. Foss. Fishes*, vol. iii, p. 463.

⁴ *Texas*, etc., p. 419.

⁵ *Kreidebild. von Texas*, p. 30.

⁶ *Trans. Amer. Philos. Soc.*, vol. iv, p. 381.

⁷ Dames, W. *Zeitschr. deutsch. geol. Ges.*, vol. xxxv (1883), pp. 656-670.

his *North American Geology and Palæontology*. This Appendix was issued about the beginning of the year 1893, and contains a number of new names which were proposed as substitutes for preoccupied generic names of fishes. These are, omitting those already mentioned, as follows: *Eczematolepis* for *Acantholepis* Newberry; *Tegeolepis* for *Actinophorus* Newberry; *Ponerichthys* for *Dinichthys* Newberry; *Dissodus* for *Diplodus* Agassiz; *Haplolepis* for *Eurylepis* Newberry; *Gamphacanthus* for *Heteracanthus* Newberry; *Lispognathus* for *Liognathus* Newberry; *Millerichthys* for *Pterichthys* Agassiz; *Oestophorus* for *Sphenophorus* Newberry.

Most of these names proposed by Miller must, I think, be accepted, but not all. For *Diplodus*, which is manifestly preoccupied, *Dissodus* is not required, since there is a number of available synonyms of *Diplodus*. Of these *Dittodus* (Owen¹) is probably to be preferred. In proposing *Ponerichthys* to replace *Dinichthys* Miller labored under a misapprehension. The genus *Dinichthys* was founded by Dr. Newberry in 1868,² being based on the species *D. herzeri*. In the same year Prof. C. H. Hitchcock³ published an account of *Dinichthys*, but it was a report of Newberry's discovery, and the author made no pretense of claiming credit for the name. In any case, there is no demand for a new name since the *Dinichthys* of both writers was based on the same species.

As regards *Pterichthys*, there is no getting around the fact that the name as employed by Agassiz in 1844 is preoccupied. Swainson in 1839⁴ first applied the name to a group of recent fishes, defining it and referring to it a number of recognized species. But *Millerichthys*, proposed in honor of Hugh Miller, is superfluous, as well as devoid of euphony. Peter Bleeker as long ago as 1859⁵ had perceived that the *Pterichthys* of Agassiz was antedated, and by a lucky stroke of his pen had parenthetically proposed *Pterichthyodes* in its place. This

¹ See A. S. Woodward's *Cat. Foss. Fishes*, part i, p. 2.

² *Proc. Amer. Assoc. Adv. Sci.*, 16th meeting, p. 146.

³ *Geolog. Mag.*, [1], vol. v, p. 184.

⁴ *Nat. Hist. and Class. Fishes*, etc., ii, p. 265.

⁵ *Enum. Spec. Pisc. Arch. Ind.*, Tentamen, p. 11.

name does not appear anywhere else, so far as I know, and I am indebted for my knowledge of it to Dr. T. N. Gill, who is so thoroughly informed on all that pertains to the classification of fishes.

For information regarding the status of the generic names mentioned in this paper as being employed in entomology, I am indebted to Messrs. Ashmead and Schwarz of the department of entomology in the U. S. National Museum.